

Ceratitinae (Diptera: Tephritidae) from the Malagasy subregion

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Seventeen species of ceratitine Tephritidae are recorded from Madagascar, the Mascarenes, Seychelles and Comoros. Eight species are described as new: *Ceratitis* (*Ceratitis*) *manjakatempo* sp. nov., *Ceratitis* (*Ceratalaspis*) *andranotobaka* sp. nov., *Ceratitis* (*Pterandrus*) *tananarivana* sp. nov., *Carpophthoromyia speciosa* sp. nov., *Trirhithrum argenteocuneatum* sp. nov., *T. crescentis* sp. nov., *T. iridescens* sp. nov., *T. resplendens* sp. nov., all from Madagascar. *Pardalaspis cyanescens* Bezzi is transferred to the genus *Trirhithromyia* Hendel (comb. nov.) and *Perilampsis bourbonica* Munro is placed as a synonym thereof (syn. nov.). *Pardalaspis Bezzi* and *Pterandrus Bezzi* are placed as subgenera of *Ceratitis* MacLeay, and their limits redefined. A new subgenus *Ceratalaspis* nov., with type-species *Trypeta cosyra* Walker, is proposed for several species formerly included in *Pardalaspis*. The subgenus *Pinacochaeta* Munro is placed as a synonym of typical *Ceratitis* (syn. nov.).

The Ceratitinae are a group of predominantly fruit-infesting species, especially well represented in the Afrotropical Region. Several species are of major economic importance. The Madagascar fauna is poorly known, only three species having been recorded previously (Cogan & Munro 1980). The Madagascar total is raised here to 14 species, with eight described as new. Of the 17 species now known to occur in Madagascar, the Mascarenes, Seychelles and Comoros, 12 are endemic, whilst five occur also on the African mainland. The 12 endemics are illustrated in this paper.

Depositories of examined material are abbreviated as follows: NCI – National Collection of Insects, Plant Protection Research Institute, Pretoria; NM – Natal Museum, Pietermaritzburg; NMB – Naturhistorisches Museum, Basel; MHN – Muséum National d'Histoire Naturelle, Paris.

Family TEPHRITIDAE

Subfamily CERATITINAE

The higher classification of this family is still in dispute. The classification used here follows that of Cogan and Munro (1980) except that *Pterandrus Bezzi* and *Pardalaspis Bezzi* are regarded as subgenera of *Ceratitis* MacLeay, and a new subgenus *Ceratalaspis* nov. is proposed to accommodate several species formerly included in *Pardalaspis*.

As currently defined, *Ceratitis*, *Pterandrus* and *Pardalaspis* are separated solely on the basis of male secondary sexual characters, with females being inseparable at the generic level. *Pardalaspis* is currently recognized by the absence of the secondary sexual characters used to define the other genera, and appears to be polyphyletic, with some species allied to *Ceratitis* and others to *Pterandrus*. Munro (1969) also noted that many species placed in *Pardalaspis* did not belong there.

An examination of the series *capitata* Wiedemann, *caetrata* Munro, *catoirii* Guérin-Méneville, *malgassa* Munro, *cornutus* Bezzi and *antistictica* Bezzi serves to illustrate the shortcomings of the current arrangement of genera. The first four species are placed in *Ceratitis*, *cornutus* is referred to *Pterandrus* and *antistictica* to *Pardalaspis*. The species placed in *Ceratitis* all have the lower superior orbital bristles of the males modified and ending in a spatulate process. They also have broad wings. *C. cornutus* is placed in *Pterandrus* because the femora of the males are feathered, a character used to define that genus. However, this feathering is orange and appears homologous to that seen in typical *Ceratitis*, rather than the denser, usually black feathering typical of *Pterandrus*. The thoracic markings of *cornutus* also resemble those of *Ceratitis* and the wings are similarly broad. Furthermore, *cornutus* has the lower superior orbital bristles of the male modified, as in typical *Ceratitis*, although the spatulate process is absent; in this it resembles *C. pinax* Munro. In the case of *C. antistictica*, the lower superior orbital bristles are not modified and the femora not feathered but the thoracic markings, shortly plumose aristae and broad wings are similar to those of *cornutus*. These two species also share the same genus of host plants, *Oxyanthus*, a member of the Rubiaceae.

A more natural arrangement of the species of *Ceratitis* is suggested below, with the subgenera re-defined. *Pardalaspis* is restricted in its concept and considered to be a close ally of *Pterandrus*. This results in the need for a new subgenus to contain several species formerly included in *Pardalaspis* that can no longer be placed there, since their affinities appear to lie closer to *Ceratitis* than to typical *Pardalaspis*.

A further, non-morphological character that suggests the arrangement presented below is a natural one, is the response of males to the attractant trimedlure, widely used in monitoring populations of *C. capitata*. Species that have been tested so far in *Ceratitis* (*capitata*, *cornuta*), *Pterandrus* (*rosa* Karsch, *rubiworus* Coquillett, *pedestris* Bezzi) and *Pardalaspis* (*punctata* Wiedemann, *cuthbertsoni* Munro) are all attracted to trimedlure, whereas those in *Ceratalaspis* nov. (*bipustulata* Bezzi, *cosyra* Walker, *melanaspis* Bezzi, *quinaria* Bezzi, *stictica* Bezzi) show no response (based on trapping experiments in areas where these species are known to occur).

Subgenus *Ceratitis* MacLeay

Ceratitis MacLeay, 1829: 482. Type-species *Ceratitis citriperda* MacLeay, 1829 (= *Tephritis capitata* Wiedemann, 1824).

Pinacochaeta Munro, 1933: 34. Type-species *Ceratitis pinax* Munro, 1933 (as subgenus); syn. nov.

This subgenus is recognized primarily by the broad wings and thoracic pattern. As in the other subgenera, the wing pattern is brown and yellow, with numerous dark basal streaks and spots; in this subgenus the yellow areas of the wing are extensive. The mesonotum is red-brown to grey with distinct black patches. Male secondary sexual characters, when present, consist of modifications to the lower superior orbital

bristles, which may or may not have prominent spatulate terminal processes. Where known, males are attracted to trimmedlure.

Eight species: *antistictica* Bezzi, *caetrata* Munro, *capitata* (Wiedemann), *catoitrii* Guérin-Méneville, *cornuta* (Bezzi), *malgassa* Munro, *manjakatampo* spec. nov., *pinax* Munro.

Subgenus *Pterandrus* Bezzi

Pterandrus Bezzi, 1918: 231. Type-species *Ceratitis rosa* Karsch, 1887.

This subgenus can be recognized by the thoracic markings and lack of abdominal spots. The mesonotum is brown to grey, with darker longitudinal lines or streaks which do not form distinct black patches. The wings are narrower and the markings darker than in *Ceratitis* (except in *C. tripteris* (Munro)), with the yellow areas of the wings reduced. Male secondary sexual characters consist of black feathering (ochraceous in *C. fulcoides* Munro) on the legs (femora and/or tibiae), or a black and white pattern on the fore femora. The feathering on the legs varies in development within the subgenus. Where known, males are attracted to trimmedlure. Although *C. pedestris* (Bezzi) and *C. lobata* Munro are usually placed in *Pardalaspis*, their thoracic patterns suggest a relationship with *Pterandrus*. The species *gravinotata* (Munro) probably belongs to *Trirhithromyia* Hendel, not to *Pterandrus*.

Sixteen species: *acicularis* (Munro), *anoniae* Graham, *colae* Silvestri, *curvata* (Munro), *flexuosa* (Walker), *fulcoides* (Munro), *lepida* (Munro), *lobata* Munro, *pedestris* (Bezzi), *penicillata* Bigot, *pinnatifemur* Enderlein, *podocarpus* (Bezzi), *rosa* Karsch, *rubivora* Coquillett, *tanariviana* spec. nov., *tripteris* (Munro).

Subgenus *Pardalaspis* Bezzi

Pardalaspis Bezzi, 1918: 233. Type-species *Trypeta punctata* Wiedeman, 1824.

This subgenus, as re-defined here, is close to *Pterandrus*, differing in the spotted abdomen, uniformly brown humeral calli and larger size. As in *Pterandrus* the mesonotum is brown to grey with darker longitudinal lines or streaks, and the wing markings dark, with the yellow areas much reduced. There are no male secondary sexual characters but the frons has silvery areas. Where known, males are attracted to trimmedlure. Many of the species formerly included in this subgenus appear to belong to a separate subgenus, described below, closer to *Ceratitis* than to *Pardalaspis* in its affinities.

Six species: *bremii* Guérin-Méneville, *cuthbertsoni* Munro, *ditissima* (Munro), *edwardsi* (Munro), *punctata* (Wiedemann), *pycnanthi* (Ghesquière).

Subgenus *Ceratalaspis* nov.

Type-species *Trypeta cosyra* Walker, 1849.

As the name suggests, this subgenus appears intermediate between *Ceratitis* and *Pardalaspis*. The wings are narrower than in *Ceratitis* but the pattern is similar, being brown and yellow with dark basal streaks and spots. The pattern is paler than in *Pterandrus* and *Pardalaspis*, the yellow areas generally being as extensive as in *Ceratitis*. The thoracic markings resemble those of *Ceratitis*. The mesonotum is generally orange-brown to red-brown and usually has distinct black patches or spots although these

markings are sometimes reduced to small spots. The abdomen is unspotted except in *C. lentigera* Munro and *C. nana* Munro, but these spots are arranged differently to those in *Pardalaspis*. There are no male secondary sexual characters and, where known, males show no response to trimmed lure.

Thirty-one species: *aliena* (Bezzi), *andranotobaka* spec. nov., *argenteobrunnea* Munro, *bipustulata* (Bezzi), *brucei* Munro, *contramedia* (Munro), *cosyra* (Walker), *discussa* (Munro), *dumeti* Munro, *epixantha* (Hering), *giffardi* Bezzi, *grahami* Munro, *guttiformis* Munro, *lentigera* Munro, *lineata* (Hering), *lunata* Munro, *marriotti* Munro, *melanaspis* (Bezzi), *melanopus* Hering, *morstatti* Bezzi, *nana* Munro, *ovalis* Munro, *quinaria* (Bezzi), *roubaudi* (Bezzi), *sarcocephali* (Bezzi), *scaevolae* (Munro), *silvestri* Bezzi, *simi* Munro, *stictica* Bezzi, *striatella* Munro, *turneri* Munro.

The shortened head of *C. pinax* and lack of the spatulate ends to the lower superior orbital bristles have been used to define the subgenus *Pinacochaeta* Munro, but the shortened head is seen also in *C. manjakatampo* spec. nov. and, to a lesser degree, in *C. cornuta*. The latter species (and presumably also *C. manjakatampo*) likewise have modified but non-spatulate lower superior orbital bristles. The range of characters seen in subgenus *Ceratitus* thus does not support the recognition of *Pinacochaeta* as a separate subgenus. The well developed lower superior orbital bristles in the females are seen throughout the genus.

A key to genera was provided by Bezzi (1924b); specific keys are included below where appropriate. *Pardalaspis cyanescens* Bezzi is transferred to *Trirhithromyia* Hendel; it appears to be related closely to *T. lycii* (Coquillett).

Genus CERATITIS MacLeay

Key to species known from the Malagasy subregion. (*Trirhithromyia cyanescens* is included here, since it keys to *Pardalaspis* in Bezzi (1924b).)

- 1 Scutellum broadly yellow at base, the dark apical portion not subdivided; humeral calli yellow except brown anteriorly; dark lateral margins of mesonotum often with a blue or green metallic sheen; wings without yellow areas in the brown bands, cubital band free, marginal band joined to basal and medial band joined to marginal (Fig. 6) **Trirhithromyia cyanescens** (Bezzi)
- Scutellum narrowly yellow at base, the dark apical area excised or divided into three by yellow lines; humeral calli yellow, with or without a brown central spot; mesonotum without a metallic sheen; wings with yellow areas in the brown bands **Ceratitus** 2
- 2 Scutellum with apical dark area not divided into three; mesonotum with ground colour dark red-brown to grey; humeral calli with dark central spot; male with lower superior orbital bristle modified (unknown in *C. manjakatampo* spec. nov.); wing with marginal band free from basal 3
- Scutellum with apical dark area divided into three; mesonotum often fulvous or pale brown; male with superior orbital bristles unmodified 6
- 3 Wing with medial band absent and cubital band free; male with spatulate end of lower superior orbital bristle black **capitata** (Wiedemann)
- Wing with medial band present; male with spatulate end of lower superior orbital bristle, when present, white 4
- 4 Wing with cubital band united with basal and medial band free (Fig. 1) **catoirii** Guérin-Ménéville
- Wing with cubital band free and medial band united with marginal 5

- 5 Arista pubescent; mesonotum without distinct dorso-lateral diagonal yellow bands across the sutures; head not noticeably shortened; medial band of wing broad (Fig. 2) **malgassa** Munro
- Arista plumose; mesonotum with distinct dorso-lateral diagonal yellow bands across the sutures; head noticeably shortened; medial band of wing narrow (Fig. 3) **manjakatampo** sp. nov. 7
- 6 Wing with marginal band free from basal; male with black 'feathering' on middle tibiae 8
- Wing with marginal band united with basal; male without black 'feathering' on middle tibiae 8
- 7 Wing with medial band present, united with marginal; humeral calli with dark central spot; male middle tibiae club-shaped, the black 'feathering' restricted to the thickened distal end (Fig. 5) **tanananarivana** sp. nov.
- Wing with medial band absent; humeral calli unmarked; male middle tibiae not so shaped **rosa** Karsch
- 8 Wing with medial band present; humeral calli unmarked; mesonotum black-spotted (Fig. 4) **andranotobaka** sp. nov.
- Wing with medial band absent; humeral calli with a dark central spot 9
- 9 Mesonotum orange-brown with black spots; male with fore femora not patterned black and white **cosyra** (Walker)
- Mesonotum grey with darker longitudinal markings; male with fore femora patterned black and white on inner surfaces **pedestris** (Bezzi)

Subgenus *Ceratitis* MacLeay

Ceratitis (*Ceratitis*) *capitata* (Wiedemann)

The Mediterranean Fruit Fly

Tephritis capitata Wiedemann, 1824: 55. Type-locality 'Ostindien'.

This widely distributed species is often a major pest of fruit. Prior to 1955 it was a common pest of deciduous fruit in Mauritius but by 1960 had been largely displaced by *C. (Pterandrus) rosa*, being restricted by that time to ripe chillies and jujube (*Ziziphus jujuba*) and rarely to guava, peach and corinda (*Carissa carandas*) (Orlan & Moutia 1960, Orlan 1962a). Lamb (1914) recorded it from an introduced creeper (*Passiflora foetida*) in the Seychelles.

MATERIAL EXAMINED. MADAGASCAR (EAST): 2 ♂, Ivontaka, 15 m, Mananara district, 10–14.iii.1958, B. Stuckenberg (NM). (SOUTH): 2 ♀, Antalaha, 28.iv.1958, F. Keiser (NMB).

DISTRIBUTION. Widespread throughout the warmer regions of the world, including Madagascar, Mauritius and the Seychelles.

Ceratitis (*Ceratitis*) *catoirii* Guérin-Méneville, Fig. 1

The Mascarene Fruit Fly

Ceratitis catoirii Guérin-Méneville, 1843: 197. Type-locality Mauritius.

This species is endemic to the Mascarenes, a record from the Seychelles apparently being erroneous (Orlan & Moutia 1960). In Mauritius the species has many wild and cultivated fruit hosts, such as avocado, carambola (*Averrhoa carambola*), custard apple, guava, Indian almond (*Terminalia catappa*) jamalac (*Eugenia aquea*), jujube (*Ziziphus jujuba*), loquat, mango, peach, pomegranate, tangerine and tomato (Orlan &

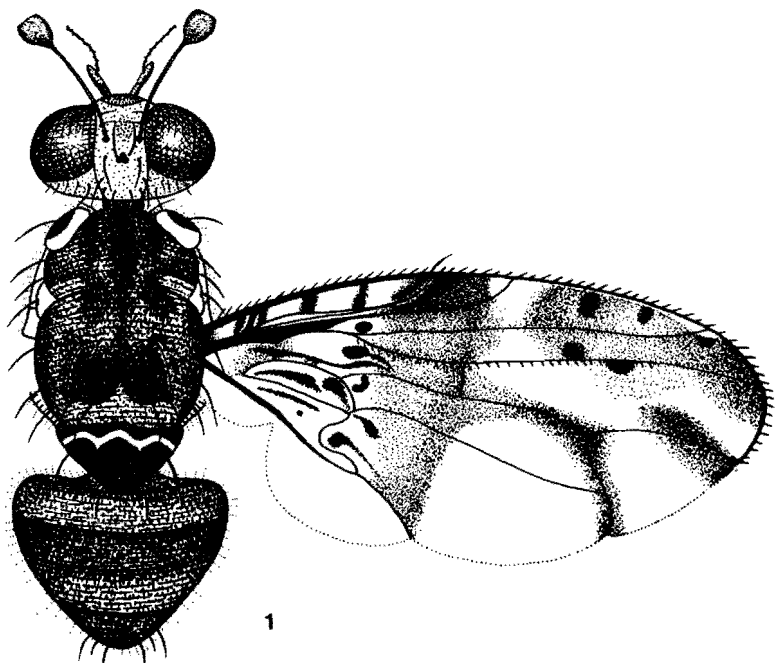


Fig. 1. *Ceratit* (*Ceratit*) *catoirii* Guérin-Méneville, male.

Moutia 1960), chillies and pepper (Orian 1962a). At Durban in 1919, specimens were detected in Mauritian mangoes (Munro 1925) but did not become established.

An interesting feature of this and the following species is the long orange 'feathering' on the male femora. This is especially noticeable on both dorsal and ventral surfaces of the fore femora and posterior portion of the hind femora, but it is also evident on the ventral surface of the mid femora, especially posteriorly, and the hind tibiae. The femoral feathering is also present, but to a lesser and paler degree, in *C. capitata*.

MATERIAL EXAMINED. MAURITIUS: 3 ♂, 3 ♀, Palmar, 14.ix.1932, J. Vinson (NCI).

DISTRIBUTION. Mauritius, Rodrigues, Réunion.

Ceratit (*Ceratit*) *malgassa* Munro, Fig. 2

The Madagascar Fruit Fly

Ceratit* (*Ceratit*) *malgassa Munro, 1939: 141. Type-locality Tananarive, Madagascar (Central).

This species has been recorded only from Madagascar. Its pest status is unknown but its hosts are likely to be similar to those of *C. catoirii*.

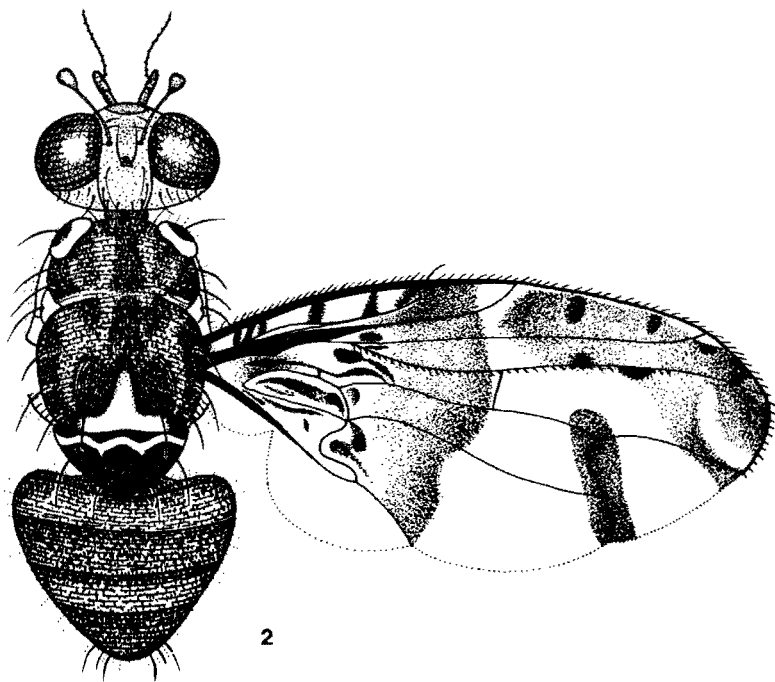


Fig. 2. *Ceratitis (Ceratitis) malgassa* Munro, male.

MATERIAL EXAMINED. MADAGASCAR (NORTH): 1 ♀, Montagne des Français, Diego-Suarez district, ii.1959, A. Robinson (NCI); 1 ♀, N. of Beangona-Ambevy, Vallée d'Antremabe, 400 m, Ambanja district, ii.1964, P. Soga (MHN). (WEST): 1 ♂, 3 ♀, Ampijeroa, 170 m, Ankarafantsika, Marovoay district, i.1957, R. E.; 1 ♀, Andobo, 190 m, Antsingy forest, Antsalova district, ii.1957, P. Griveaud (NCI). (CENTRAL): 2 ♂, 2 ♀, Tananarive, ii.1962; 3 ♂, Tsimbazaza, Tananarive (det. H. K. Munro, 1968) (NCI); 1 ♂, 2 ♀, Tananarive; 6.iv.1958, F. Keiser (NMB). (EAST): 3 ♂, 1 ♀, Perinet, Moramanga district; 3 ♂, 2 ♀, Sandrangato, Moramanga district (NCI); 1 ♀, Navana-Antongil, 6 m, Maroantsetra district, 20–25.iii.1958, B. Stuckenberg (NM); 1 ♀, Farankaraina Forest Station, Navana road, 16.5 km, Vallée d'Antoroka, 160 m, Maroantsetra district, 8–18.i.1964, P. Viette; 1 ♂, Vatomandry, xii.1929, A. Seyrig (MHN).

DISTRIBUTION. Madagascar.

***Ceratitis (Ceratitis) manjakatampo* sp. nov., Fig. 3**

This species resembles *C. pinax* Munro in head shape and thoracic markings but has a different wing pattern, with the marginal band free from the basal band, and with a medial band present and joined to the marginal band. The thoracic and wing

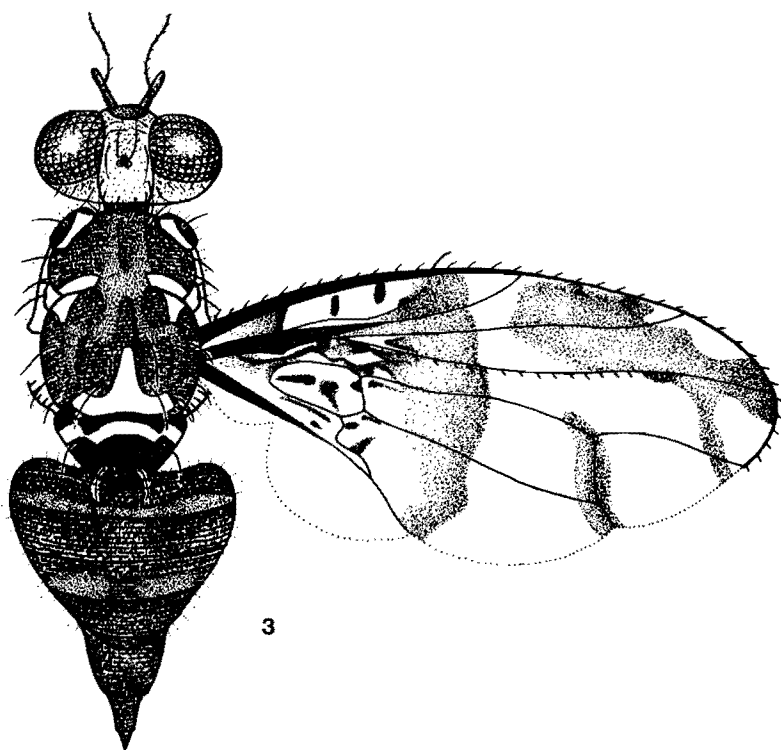


Fig. 3. *Ceratitis (Ceratitis) manjakatampo* sp. nov., female.

markings closely resemble those of *C. malgassa* but the medial band is narrower, the head is shorter, and the arista is plumose.

MALE. Unknown.

FEMALE. Length of body (excluding ovipositor), 3,7 mm; of wing, 4,0 mm.

Head. Length: height: width: 1:1,8:2,1. Frons narrowing slightly anteriorly, 0,33 times width of head at widest part, yellow, with a brown oval area around superior orbital bristles on each side; bristles dark brown, ocellars well developed, two inferior orbitals, two superior orbitals. Lunule small, fulvous. Antennae about two-thirds length of face, fulvous; arista with short plumosity. Face whitish. Cheeks narrow, whitish. Genae fulvous below eyes, genal bristle and a row of fine peristomal bristles red-brown. Occiput fulvous, a row of brown occipital bristles.

Thorax. Mesonotum shining dark red-brown with a pale brown pattern, covered with pale pubescence, as follows: an H-shaped medial pattern, the bar of the H lying between the sutures: a pair of post-sutural dorso-lateral stripes. There are a pair of short, diagonal, dorso-lateral yellow bands across the sutures, and the notopleural calli

are yellow. Humeral calli whitish with a brown central spot. Pleurae fulvous, becoming white dorsally; mesopleura with two parallel white bars, the upper along the dorsal edge extending to the mesopleural bristle, the lower narrower and separated from it by a fulvous band. Upper hypopleural calli white with a horizontal median brown bar; lower hypopleural calli white. Bristles dark brown, normal, one mesopleural. Scutellum dark red-brown with a narrow yellow band anteriorly; four scutellar bristles. Legs fulvous. Wing with the third vein setulose; hyaline with dark basal streaks and spots and the following bands: a yellow basal band, becoming brown posteriorly; a yellow marginal band, becoming brown marginally and apically, free from the basal band at stigma; a narrow brown medial band, united with the marginal; a brown cubital band through lower cross-vein, free from both marginal and basal bands.

Abdomen. Fulvous, posterior parts of second and fourth segments with whitish dust. Oviscape fulvous, length 0.5 mm, shorter than abdomen. Aculeus fulvous, pointed at tip.

MATERIAL EXAMINED. Holotype, ♀: MADAGASCAR (CENTRAL): Manjakatampo, 5.i.1958, F. Keiser (NMB), and 1 ♀ paratype same locality.

DISTRIBUTION. Known only from central Madagascar.

Subgenus *Ceratalaspis* nov.

Ceratitis (Ceratalaspis) andranotobaka sp. nov., Fig. 4

This new species resembles *C. (Ceratalaspis) stictica*, having similar thoracic and scutellar markings and a medial band on the wing. It differs in having the arista pubescent, the cubital band on the wing free from the basal band and, in the female, a much longer ovipositor.

MALE. Length of body, 4.5 mm; of wing, 5.0 mm.

Head. Length: height: width: 1: 1.5: 1.9. Frons narrowing anteriorly, 0.28 times width of head at widest part, fulvous, becoming red-brown anteriorly; bristles black, ocellars well developed, two inferior orbitals, two superior orbitals. Lunule small, red-brown. Antennae about two-thirds length of face, fulvous; arista pubescent. Face yellowish-white. Cheeks narrow, brown. Genae brown below eyes, genal bristle and a row of fine peristomal bristles brown. Occiput fulvous, a row of brown occipital bristles.

Thorax. Mesonotum fulvous with blackish-brown spots as follows: three laterally; three dorsolaterally, the posterior one large, extending narrowly to dorsocentral bristle and margined posteriorly by a whitish spot; two medially, the anterior weak, the posterior a streak. Pleurae fulvous, paler dorsally. Bristles black, normal, two mesopleurals. Scutellum blackish-brown with a narrow yellow band anteriorly, extensions from this band narrowly dividing the posterior part into three broad subquadrate spots; four scutellar bristles. Legs fulvous. Wing with third vein setulose; hyaline with dark basal streaks and spots and the following bands: a yellow basal band, becoming brown posteriorly; a yellow marginal band connected to the basal band at the stigma, becoming brown marginally and apically; a narrow brown medial band, united with the marginal; a brown cubital band through lower cross-vein, free from marginal and basal bands.

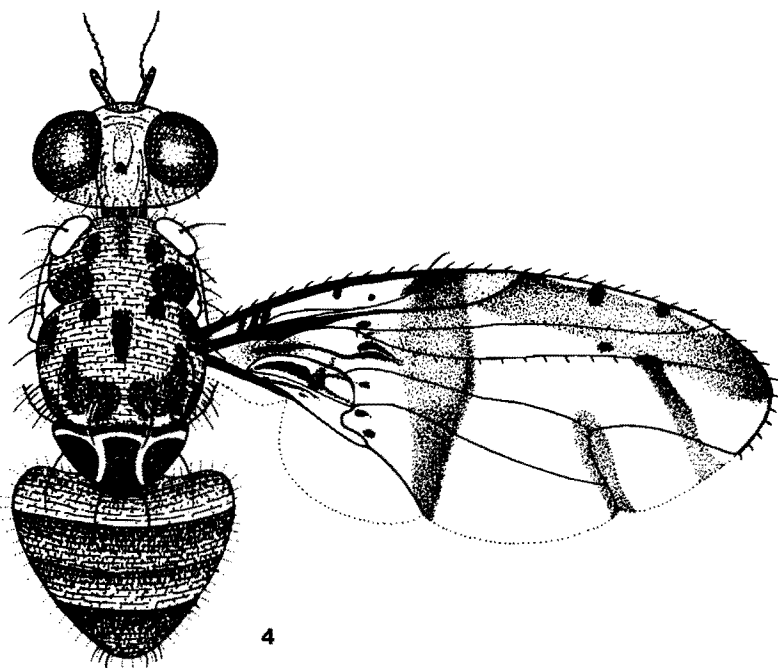


Fig. 4. *Ceratit* (*Ceratalaspis*) *andranotobaka* sp. nov., male.

Abdomen. Fulvous, anterior margins of third and fourth segments darker, posterior parts of second, third and fourth segments with whitish dust.

FEMALE. As for male but medial band of wing reduced, almost absent in central portion. Oviscape fulvous, length 1,8 mm, as long as abdomen.

MATERIAL EXAMINED. Holotype ♂: MADAGASCAR (EAST): Andranotobaka, 1400 m, Ambatolampy district, iii.1957, P. Griveaud (NCI). Paratype ♀ same locality and collector but iv.1957 (NCI).

DISTRIBUTION. Only known from east Madagascar.

***Ceratit* (*Ceratalaspis*) *cosyra* (Walker); comb. nov.**

The Marula Fruit Fly

Trypeta cosyra Walker, 1849, 1042. Type-locality 'Congo'.

This species is widespread on the African mainland, where it has a number of hosts. It is occasionally a minor pest of subtropical fruits such as avocado, custard apple and guava (Hancock 1981). It is recorded here for the first time from Madagascar, where it has been bred from the fruits of 'Sakoa'.

MATERIAL EXAMINED. MADAGASCAR (WEST): 1 ♀, Banian, 70 m, Anka-
zoaba district, vii.1957, A. Robinson (NCI). (SOUTH): 1 ♂, 2 ♀, Betioky, vi.1957, R.
Paulian, ex fruits of 'Sakoa' (NCI).

DISTRIBUTION. Sub-Saharan Africa and south-west Madagascar.

Subgenus *Pterandrus* Bezzi

***Ceratitis (Pterandrus) pedestris* (Bezzi); comb. nov.**

The Strychnos Fruit Fly

Pardalaspis pedestris Bezzi, 1924a: 480. Type-localities Durban, Natal and Pretoria,
Transvaal, South Africa.

This species is widespread in the southern half of Africa where its hosts are
various species of *Strychnos*. It is occasionally a minor pest of tomatoes (Hancock 1981).
It is recorded here from Madagascar for the first time.

MATERIAL EXAMINED. MADAGASCAR (NORTH): 1 ♂, Montagne des
Français, Diego-Suarez district, ii.1959, A. Robinson (NCI). (EAST): 1 ♀, Sainte-
Luce, 7 m, Fort Dauphin district, 22.ii.1958, P. Griveaud (NCI).

DISTRIBUTION. Angola, Zambia, Zimbabwe, South Africa and Madagascar.

***Ceratitis (Pterandrus) rosa* Karsch**

The Natal Fruit Fly

***Ceratitis rosa* Karsch, 1887: 22.** Type-locality Delagoa Bay, Moçambique.

This species is widespread in Africa, where it is a major pest of deciduous
fruits. Orian (1962b) noted it to be by far the most injurious fruit fly in Mauritius. In
Mauritius it has been recorded from avocado, guava, Indian almond (*Terminalia catap-*
pa), jamalac (*Eugenia aquea*), jujube (*Ziziphus jujuba*), loquat, mango, papaw, peach, sa-
podilla (*Acleros sapota*), bullock's heart (*Anona reticulata*), pineapple guava (*Fijoa sello-*
wiana) and rose apple (*Eugenia jambos*) (Orian & Moutia 1960). It is especially injurious
to loquat, peach, guava, mango, avocado and bullock's heart. Moutia (1955) did not
record *rosa* as being a common pest but since that date it appears to have largely dis-
placed *C. capitata* in Mauritius. Orian and Moutia (1960) suggest that the species was
introduced from South Africa, probably in 1953. By 1957 it had become very abundant
and a major pest.

Orian and Moutia (1960) provided illustrations of the wing and male middle
leg, which readily distinguish this species from the Madagascan *C. (P.) tananarivana*
spec. nov., described below.

DISTRIBUTION. East, central and southern Africa, Mauritius and Réunion.

***Ceratitis (Pterandrus) tananarivana* sp. nov., Fig. 5**

This new species can be distinguished from all other members of the subgenus
by the well developed medial wing band, united with the marginal band, and the pecu-
liar modifications of the mid tibiae and tarsi of the male.

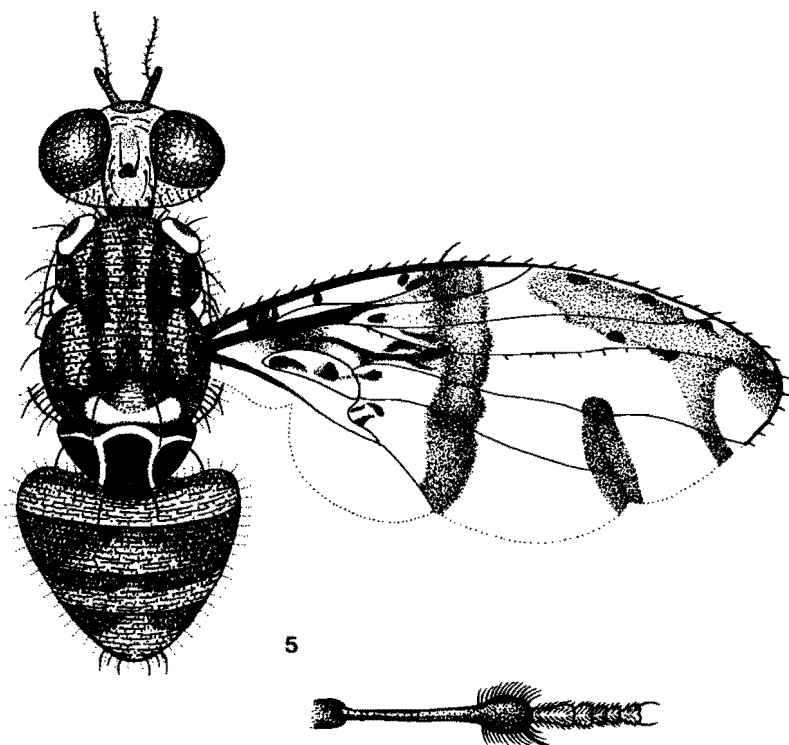


Fig. 5. *Ceratitis (Pterandrus) tananarivana* sp. nov., male and mid tibia-tarsi.

MALE. Length of body, 4,7 mm; of wing, 5,0 mm.

Head. Length:height:width: 1:1,5:1,9. Frons broad, 0,35 times width of head, yellow-fulvous; bristles black, ocellars well developed, two inferior orbitals, two or three superior orbitals (often two on one side, three on the other). Lunule small, fulvous. Antennae about three-quarters length of face, fulvous except third segment often brown; arista with short plumosity. Face whitish. Cheeks narrow, fulvous. Genae fulvous below eyes, genal bristles and a row of fine peristomal bristles black. Occiput fulvous, a row of black occipital bristles.

Thorax. Mesonotum brown with extensive areas of pale pubescence, leaving dark brown longitudinal stripes medially and dorsocentrally and lateral blackish-brown patches; posteriorly the dorsocentral brown bands are expanded and bordered by a yellow area, pubescent medially. Pleurae fulvous, becoming whitish on upper part of mesopleura; upper and lower hypopleural calli whitish. Bristles normal, black, one mesopleural; mesopleura covered with long, coarse, whitish pubescence, densest on lower half. Humeral calli with a brown medial spot. Scutellum blackish-brown with a narrow yellow band anteriorly, extensions from this band narrowly dividing the posterior part into three broad subquadrate spots; four scutellar bristles. Legs fulvous except

fore and mid tibiae and mid tarsi whitish; fore femora with long, dense and whitish feathering along dorsal edge and a row of dark bristles along ventral edge; fore tibiae slightly compressed and expanded laterally; mid tibiae strongly compressed and club-shaped, being narrow at base and with a swollen distal end covered with long black feathering on the lateral edges, and long silvery feathering on the ventral side of the club; mid tarsi dorso-ventrally compressed, silvery on ventral side; mid tibiae with a black terminal spine. Wings with third vein setulose; hyaline with dark basal streaks and spots and the following bands: a brown basal band, yellow in centre; a yellow marginal band, becoming brown marginally and apically, free from basal band at stigma; a brown medial band, united with the marginal; a brown cubital band through lower cross-vein, free from marginal and basal bands.

Abdomen. Fulvous, anterior halves of third, fourth and fifth segments brown-er, posterior parts of second, third and fourth segments with whitish dust.

FEMALE. As for male except legs entirely fulvous and unmodified; fore femora and mesopleura without coarse whitish feathering or long pubescence. Oviscape fulvous, short, length 0.65 mm.

MATERIAL EXAMINED. Holotype ♂: MADAGASCAR (CENTRAL): 2 ♂ and 3 ♀ paratypes, Tananarive, ii.1962, E.R.A.M. 242 (NCI). (NORTH): 1 ♂ paratype, Montagne d'Ambre, Les Rousettes, 1100 m, (Diego-Suarez district), ix & xii.1958, A. Robinson; 1 ♀ paratype, Analamerana, 80 m, 50 km SE of Diego, Diego-Suarez district, i.1959, A. Robinson (NCI). (EAST): 5 ♂, 4 ♀ paratypes, Perinet, (Moramanga district) (NCI).

DISTRIBUTION. North-eastern and central Madagascar.

Genus *TRIRHITHROMYIA* Hendel

Trirhithromyia cyanescens (Bezzi), comb. nov., Fig. 6

The Tomato Fruit Fly

Pardalaspis cyanescens Bezzi, 1923: 529. Type-locality Androy, Ambovombe district, Madagascar (South)

Perilampus bourbonica Munro, 1954: 546. Type-locality Réunion; syn. nov.

Originally described from a single female, Munro (1954) recorded a male from Tananarive bred from the fruits of *Solanum auriculatum*. Orian and Moutia (1960) noted that no wild hosts of the species had been recorded in Mauritius, whereas *Solanum nigrum* and *Solanum indicum* were used as hosts in Réunion. The species is a pest of tomatoes and appears to have been introduced to the Mascarenes from Madagascar. It was first reported as a tomato pest in 1951 in Réunion but was not detected in Mauritius before October 1958, where again it was found infesting tomatoes (Orian & Moutia 1960). Although the Réunion '*bourbonica*' specimen is undated, the type of data label used suggests that it was collected between late 1948 and 1952, labels used by the Institut Recherches Scientifique de Madagascar before late 1948 bearing a different type face.

The wing, thoracic and scutellar markings of this species are not typical of *Pardalaspis* and comparison of specimens with material of *Trirhithromyia lycii* (Coquillett)

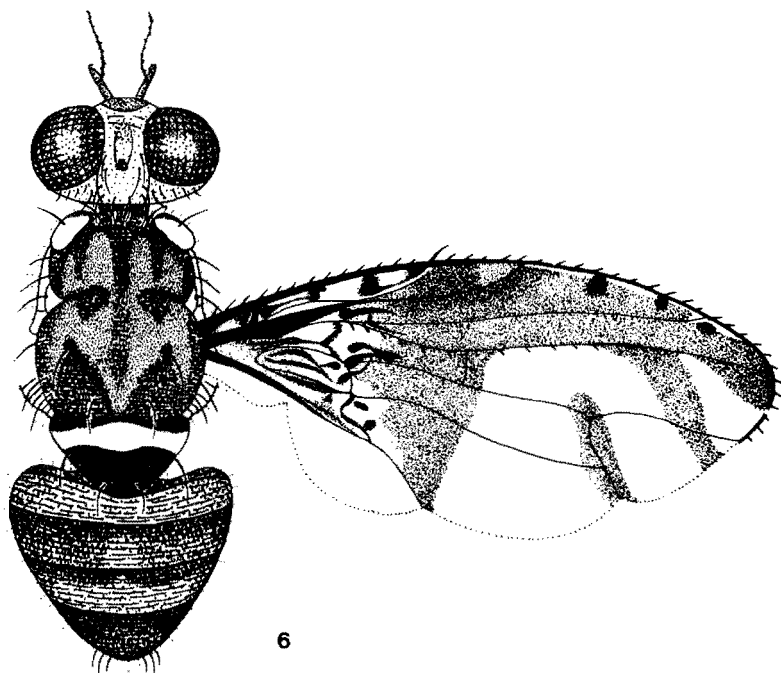


Fig. 6. *Trirhithromyia cyanescens* (Bezzi), male.

shows it to be much more closely related to that species. The similarity of the grey-dusted central thoracic markings in *cyanescens* and *lycii* is particularly striking. The scutellar and humeral calli markings are also indicative of *Trirhithromyia*, as are the uniformly brown wing bands.

Comparison of the holotype of *Perilampus bourbonica* Munro with a long series of *cyanescens* from Madagascar leaves no doubt that it is a synonym of the latter. The black thoracic spots normally have a blue or green metallic sheen but sometimes this sheen is not evident.

MATERIAL EXAMINED. MADAGASCAR: 1 ♀, Mailaka, i.1952, N. L. H. Krauss (NCI). (NORTH): 1 ♀ Montagne des Français, Diego-Suarez district, ii.1959, A. Robinson; 2 ♂, 2 ♀, Montagne d'Ambre, Les Roussettes, 1100 m, Diego-Suarez district, ix & xii.1958, A. Robinson (NCI). (CENTRAL): 11 ♂, 7 ♀, Tsimbazaza, Tananarive, xii.1958–i.1959, R. Paulian, ex fruits of 'Sevabe solanée'; 1 ♂, Tsimbazaza, Tananarive, 5.iv.1949, A. Robinson, ex fruits of *Solanum auriculatum* (NCI). (EAST): 1 ♂, Sandrangato, Moramanga district; 1 ♂, 1 ♀, Fort Dauphin, R. Paulian (NCI). (SOUTH): 6 ♂, 7 ♀, Ambosary, 220 m, Ambovombe district, vi.1957, A. Robinson (NCI).

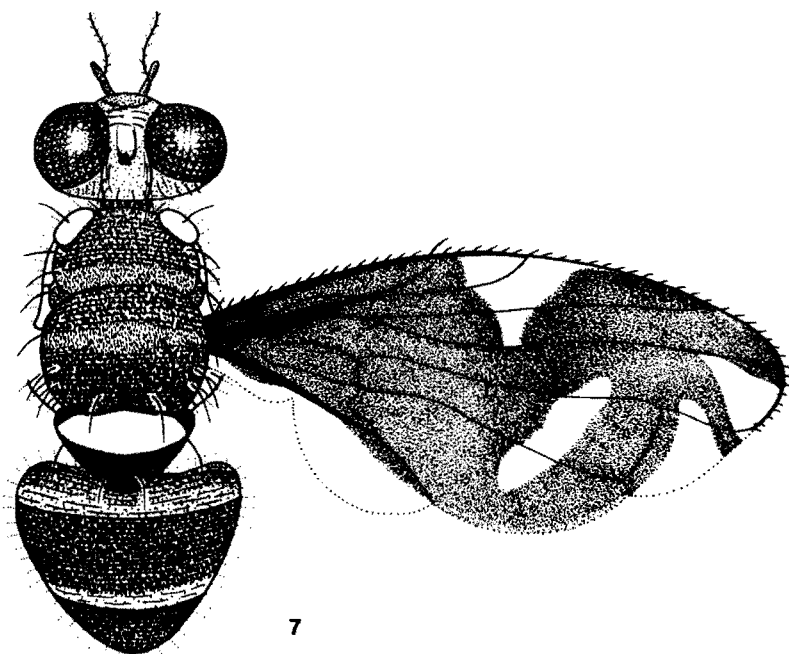


Fig. 7. *Carpophthoromyia speciosa* sp. nov., male.

RÉUNION: 1 ♂ (holotype of *Perilampus bourbonica*), no locality, Abadie (NCI).

DISTRIBUTION. Madagascar, Réunion and Mauritius.

Genus *CARPOPHTHOROMYIA* Austen

Carpophthoromyia speciosa sp. nov., Fig. 7

The abdominal pattern of this new species resembles that of *C. superba* Bezzi but wing and thoracic markings distinguish it from all other species in the genus.

MALE. Length of body, 5,5 mm; of wing 5,5 mm.

Head. Length:height:width:1:1,5:1,75. Frons narrow, 0,3 times width of head, yellow except brown around superior orbital bristles and towards vertex, sometimes the yellow reduced to a large circular central patch; bristles black, ocellars well developed, three inferior orbitals, two superior orbitals, lunule small, brown. Antennae about three-quarters length of face, orange-brown, third segment with pale pilosity, appearing whitish from above; arista with short plumosity. Face white, with or without brown ventral corners. Cheeks narrow, brown. Genae brown below eyes, genal bristle and a row of peristomal bristles black. Occiput dark brown above, paler below, with lateral

margins broadly whitish, a row of black occipital bristles that extend for a short distance into the white lateral area.

Thorax. Mesonotum blackish-brown with two transverse rows of white pubescence, one before and one behind the sutures; humeral calli yellow. Pleurae blackish-brown, a broad mesopleural yellow stripe from humeral calli, broadening posteriorly and covering upper three-quarters of mesopleura at hind edge; upper and lower hypopleural calli yellow. Bristles black, normal, two mesopleurals. Scutellum yellow on basal half, black posteriorly, the width of the black a little variable; four scutellar bristles. Legs with femora brown, tibiae and tarsi fulvous. Wing with third vein setulose and lower cross-vein straight, outwardly oblique; blackish-brown with hyaline indentations as follows: on costa, including outer half of stigma and extending to third vein; in first and second posterior cells; along extreme edge of third posterior cell; an oblique hyaline band from basal part of first posterior cell through discal cell into third posterior cell, towards anal vein, the distance extending into this cell variable.

Abdomen. Third and anterior half of fourth segments blackish-brown, posterior halves of second and fourth segments whitish, remainder dark red-brown.

FEMALE. Similar to male. Oviscape shining black with dense pubescence, long and tubular with basal two-thirds somewhat swollen, length 2.5 mm. Second segment and aculeus red-brown.

MATERIAL EXAMINED. Holotype ♂: MADAGASCAR (EAST): 2 ♂ and 2 ♀ paratypes, Sandrangato (Moramanga district); 1 ♂ paratype, Perinet (Moramanga district) (NCI). (NORTH): 2 ♂ paratypes, Analamerana, 80 m, 50 km SE Diego, Diego-Suarez district, i.1959, A. Robinson (NCI). (WEST): 1 ♂ 5 ♀ paratypes, Andobo, 190 m, Antsingy forest, Antsalova district, ii.1957, P. Griveaud; 5 ♂, 4 ♀ paratypes, Hera, Ankazoabo district; 2 ♂, 11 ♀ paratypes, Analavelona, 1320 m, (Tulear district) (NCI). (SOUTH): 1 ♂, 1 ♀ paratypes, Sept-Lacs, 100 m, nr Tulear (Betioiky district), 13-16.ii.1958, B. Stuckenberg (NM).

DISTRIBUTION. Throughout Madagascar.

Genus *TRIRHITHRUM* Bezzi

Six species of this genus are now known from the Malagasy subregion, five of which are restricted to Madagascar. These Madagascar endemics are unusual in that all the species have the thorax and abdomen largely metallic blue, green or purple rather than shining black. These metallic colours are poorly developed in teneral or immature specimens. The African species were revised by Munro (1934).

Key to species known from the Malagasy subregion

- | | |
|---|---------------------------|
| 1 Pale mesopleural stripe absent; face white; sexes dimorphic in wing markings, that of male somewhat diffuse | 2 |
| - Pale mesopleural stripe present; face white or brown; male with wing markings not diffuse; thorax and abdomen largely metallic blue, green or purple | 3 |
| 2 Thorax and abdomen shining black; wing with basal costal hyaline indentation not crossing cell; medial band of female not reaching wing margin, that of male not apparent | |
| | nigerrimum (Bezzi) |

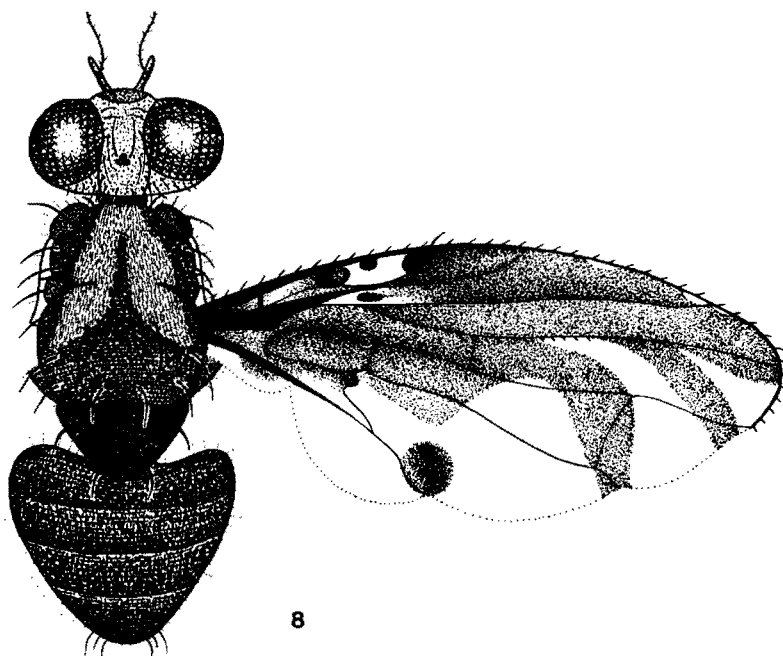


Fig. 8. *Trirhithrum argenteocuneatum* sp. nov., male.

- Thorax and abdomen metallic blue; wing with basal costal hyaline indentation extending beyond cell; medial band of female reaching wing margin, that of male shortened but distinct (Fig. 11) **manganum** Munro
- 3 Scutellum yellow towards the base, at least at sides; wing pattern with medial band, in both sexes, not reaching wing margin (Fig. 10) **iridescens** sp. nov.
- Scutellum entirely dark; wing pattern with medial band reaching wing margin 4
- 4 Face white; arista with short pubescence; mesopleural stripe oblique, broadest posteriorly, not continued to humeral callus, which is entirely dark (Fig. 12) **resplendens** sp. nov.
- Face red-brown, at least on upper half; arista plumose; mesopleural stripe horizontal, of even width and continued on lower part of humeral callus 5
- 5 Upper hypopleural calli white; humeral calli without a distinct whitish crescent on inner edge; wing of male with anal vein bent near tip and bordering a large, dark round spot, separated from the basal band; wing of female with anal vein normal and basal band continued to wing margin; male thorax with a wedge-shaped patch of pale pubescence anteriorly, silvery in front view (Fig. 8) **argenteocuneatum** sp. nov.
- Upper hypopleural calli brown; humeral calli with a distinct whitish crescent on inner edge; wing of male with anal vein not bent near tip and basal band reaching wing margin; male thorax with pale pubescence extensive behind suture, not as above (Fig. 9) **crescentis** sp. nov.

***Trirhithrum argenteocuneatum* sp. nov., Fig. 8**

This new species is similar to *T. dimorphum* Munro but the male has the anal dark spot on the wing larger, whilst both sexes have the medial band reaching the wing margin and a different thoracic pattern.

MALE. Length of body, 3,8 mm; of wing, 3,5 mm.

Head. Length:height:width:1:1,3:1,7. Frons narrow, 0,3 times width of head, red-brown, paler towards vertex; bristles black, ocellars well developed, two inferior orbitals, two superior orbitals. Lunule small, dark fulvous. Antennae about two-thirds length of face, fulvous except third segment brown; arista plumose. Face red-brown, becoming darker below antennae. Cheeks narrow, red-brown. Genae fulvous below eyes. Occiput blackish-brown above, whitish below, a row of black occipital bristles present.

Thorax. Mesonotum metallic blue, with a broad wedge-shaped red-brown area extending from anterior edge to beyond dorso-central bristles, covered in dense pubescence which appears silvery-white in front view; humeral calli brown with ventral margin whitish. Pleurae fulvous with pale pubescence; a narrow whitish stripe along upper edge of mesopleura, connected to humeral callus; upper hypopleural calli whitish. Bristles black, normal, one mesopleural. Scutellum metallic blue, four bristles. Legs fulvous, hind femora darker above. Wing with third vein setulose; pattern blackish-brown with a hyaline indentation before stigma and weak indentations in marginal and submarginal cells, sometimes vestigial in submarginal cell; medial and cubital bands reaching wing margin but basal band separated from a large, darker round spot at end of anal vein; anal vein bent at apex around spot.

Abdomen. Metallic blue without bands of silvery dust.

FEMALE. Larger than male. Length of body, 4,0 mm; of wing, 4,0 mm. Similar to male except face white on lower half, mesonotum without the band of silvery pubescence and the wing with anal vein not bent and the basal band continued to the wing margin, not with a distinct dark spot. Oviscape longer than broad, slightly narrowed posteriorly, shining blackish-brown, length 0,6 mm.

MATERIAL EXAMINED. Holotype ♂: MADAGASCAR (EAST): Perinet (Moramanga district); 1 ♂ paratype, Ranomafana, Ifanadiana district; 1 ♂ paratype, Fort Dauphin, R. Paulian (NCI); 1 ♂, 1 ♀ paratypes, Perinet, 12.iv.1958, F. Keiser; 1 ♀ paratype, Perinet, 26.ix.1958, F. Keiser; 1 ♂ paratype, Moramanga, 10.x.1958, F. Keiser (NMB).

DISTRIBUTION. East and south-east Madagascar.

***Trirhithrum crescentis* sp. nov., Fig. 9**

This species runs to *T. brachypterum* Munro in Munro's (1934) key but differs in wing shape and pattern, leg colour and the metallic body colour.

MALE. Length of body, 3,6 mm; of wing, 3,5 mm.

Head. Length:height:width: 1:1,5:2. Frons broad, 0,4 times width of head, dark fulvous except a red-brown, round central area and black bands from anterior superior orbital bristles to vertex; bristles black, ocellars well developed, two inferior orbitals, two superior orbitals. Lunule small, red-brown. Antennae about three-quarters length of face, red-brown; arista plumose. Face red-brown. Cheeks narrow, red-brown. Genae fulvous below eyes. Occiput black above, brown below, a row of black occipital bristles present.

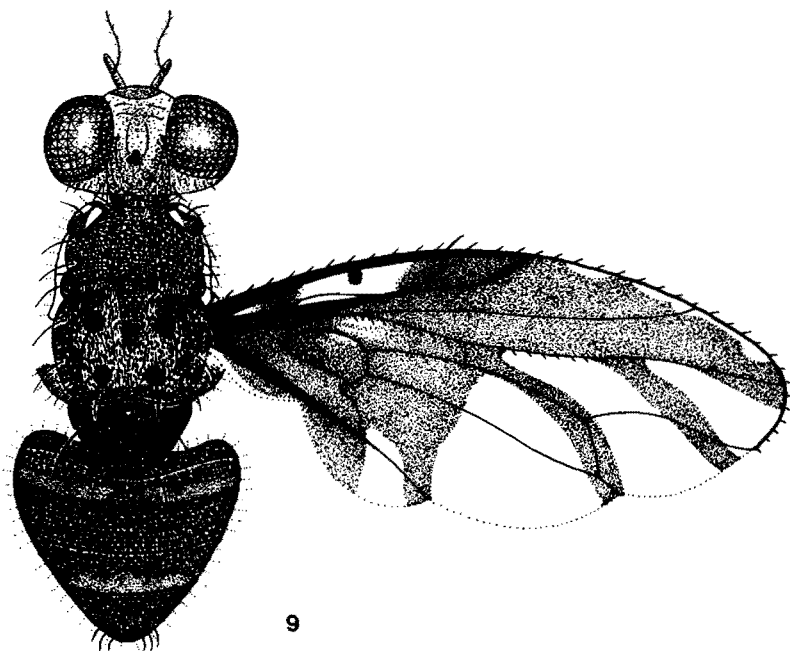


Fig. 9. *Trirhithrum crescentis* sp. nov., male.

Thorax. Mesonotum metallic dark green, with pale pubescence covering most of area behind sutures, greyish-white in front view, the pubescence dark around bristle bases and dorsolaterally behind sutures; humeral calli brown except lower margin whitish and a whitish crescent on upper portion. Pleurae blackish-brown, a narrow whitish stripe along upper edge of mesopleura, connected to humeral callus; hypopleural calli blackish-brown. Bristles black, normal, one mesopleural. Scutellum metallic dark green, four bristles. Legs fulvous, mid and hind femora browner above posteriorly. Wing with third vein setulose; pattern blackish-brown with a hyaline indentation before stigma and weak indentations in marginal and submarginal cells; medial band reaching wing margin; cubital band present.

Abdomen. Metallic dark green with bands of silvery-grey dust along hind margins of second and fourth segments.

FEMALE. Unknown.

MATERIAL EXAMINED. Holotype ♂: MADAGASCAR (EAST): Andranotobaka, 1400 m, Ambatolampy district, iv.1957, P. Griveaud (NCI).

DISTRIBUTION. Only known from east Madagascar.

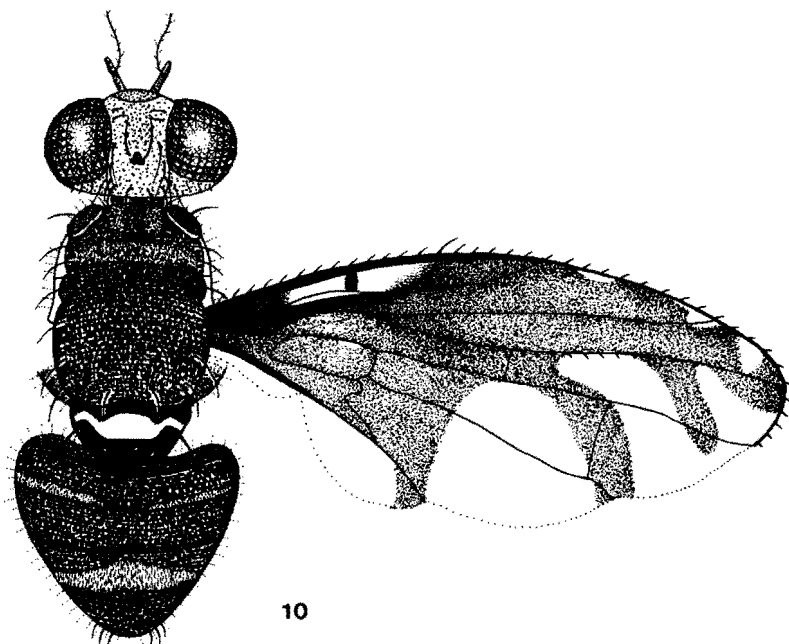


Fig. 10. *Trirhithrum iridescens* sp. nov., male.

***Trirhithrum iridescens* sp. nov., Fig. 10**

This species runs to *T. albomaculatum* (von Röder) in Munro's (1934) key but differs in having the body metallic coloured, the arista plumose, the mesopleural stripe a horizontal streak and the medial band of the wing better developed. From *T. ochriceps* (Enderlein) it differs in body and scutellum colour.

MALE. Length of body, 4.0 mm; of wing, 4.0 mm.

Head. Length:height:width: 1:1.6:2. Frons narrow, 0.3 times width of head, brown with small whitish spots behind lower superior orbital bristles, a little paler anteriorly; bristles black, ocellars well developed, two inferior orbitals, two superior orbitals. Lunule small, red-brown. Antennae about three-quarters length of face, red-brown; arista plumose. Face white (discoloured in some specimens). Cheeks narrow, fulvous to white. Genae red-brown below eyes. Occiput blackish-brown above, fulvous to whitish below, a row of black occipital bristles present.

Thorax. Mesonotum metallic blue-green to purple with a narrow band of white pubescence, often indistinct, across the sutures, and a weakly developed pair of dorsocentral bands of grey dust, strongest anteriorly; humeral calli brown with lower margins whitish and a narrow whitish mark along upper edge. Pleurae blackish-brown, a narrow whitish stripe along upper edge of mesopleura, connected to humeral callus and continued to wing base; upper hypopleural calli with a whitish band. Bristles black, normal, one mesopleural. Scutellum metallic blue-green to purple with a broad

yellow band near base, continuing laterally as small spots, in one male reduced to lateral spots only, width of yellow band somewhat variable; four scutellar bristles. Legs with femora blackish-brown, outer halves of mid and hind tibiae brown, remainder fulvous. Wing with third vein setulose; pattern blackish-brown with a hyaline indentation before stigma and in marginal and submarginal cells; medial band not reaching wing margin, crossing fourth veing or stopping at it; cubital band present.

Abdomen. Metallic blue-green to purple with bands of silvery-grey dust along hind margins of second and fourth segments.

FEMALE. Similar to male but mesonotum without band of pale pubescence across sutures. Oviscape longer than broad, slightly narrowed posteriorly, shining blackish-brown, length 0.5 mm. The grey dust often covers most of the mesonotum and the whitish spots around the orbital bristles of the frons are usually more pronounced.

MATERIAL EXAMINED. Holotype ♂: MADAGASCAR (EAST): 1 ♀ paratype, Andranotobaka, 1400 m, Ambatolampy district, iv.1957, P. Griveaud; 2 ♀ paratypes same locality and collector but iii.1957; 1 ♀ paratype, Perinet (Moramanga district), iii.1954, A. Robinson; 1 ♀ paratype, Perinet; 1 ♂ paratype, Ranomafana, Ifanadiana district (NCI); 1 ♂ paratype, Navana-Antongil, 6 m, Maroantsetra district, 20-25.iii.1958, B. Stuckenberg (NM); 2 ♀ paratypes, Perinet, 12.iv.1958, F. Keiser (NMB). (NORTH): 1 ♀ paratype, Montagne d'Ambre, Les Roussettes, 1100 m, ix and xii.1958, A. Robinson (NCI). (CENTRAL): 1 ♀ paratype, Vakoana, 1520 m, Andringitra-Ambalavao (Ambalavao district), 21-24.i.1958, B. Stuckenberg (NM).

DISTRIBUTION. Madagascar.

Trirhithrum manganum Munro, Fig. 11

Trirhithrum manganum Munro, 1954: 543. Type-locality Tananarive-Tsimbazaza, Madagascar (Central).

This species was described from four specimens of both sexes, bred from fruits of *Coffea* sp. The sexes have different wing patterns, that of the female being similar to *T. crescentis* (Fig. 9). The wings of both sexes were illustrated by Munro (1954). The round patches of pale pubescence on the thorax are silvery in front view; beneath these patches the surface is matt rather than the shiny metallic blue of the rest of the thorax and abdomen.

MATERIAL EXAMINED. MADAGASCAR (NORTH): 1 ♂, Mahatazana, 19.vi.1958, F. Keiser (NMB). (CENTRAL): 1 ♀ paratype, Tsimbazaza, Tananarive, 9.viii.1949, A. Robinson, ex fruits of *Coffea* sp.; 1 ♂, Tsimbazaza, Tananarive, x.1951, A. Robinson (NCI). (EAST): 1 ♂, 1 ♀, Andranotobaka, 1400 m, Ambatolampy district, iii.1957, P. Griveaud; 1 ♂, Ranomafana, Ifanadiana district; 2 ♀, Perinet, Moramanga district (NCI); 1 ♂, Perinet, Moramanga district, xii.1955, B. Stuckenberg (NM); 1 ♂, 1 ♀, Perinet, 26.ix.1958, F. Keiser; 1 ♀, Perinet, 6.x.1958, F. Keiser; 1 ♂, Moramanga, 19.iv.1958, F. Keiser (NMB).

DISTRIBUTION. Madagascar.

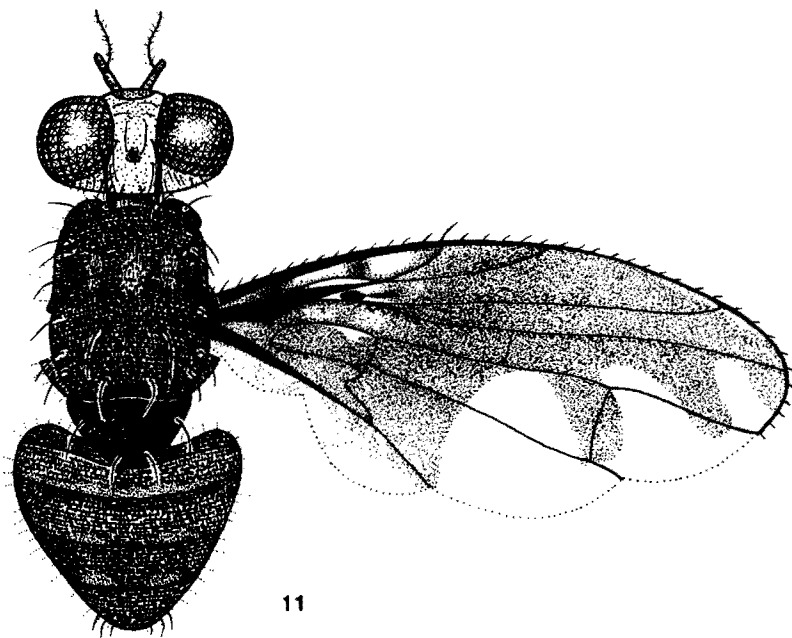


Fig. 11. *Trirhithrum manganum* Munro, male.

Trirhithrum nigerrimum (Bezzi)

Ceratitis nigra var. **nigerrima** Bezzi, 1913: 26. Type-locality Lagos, Nigeria.

Ceratitis nigerrima Bezzi; Silvestri, 1913: 67.

This species is widespread in Africa, where it is a pest of coffee. As in *T. manganum*, the sexes have different wing patterns, both of which were illustrated by Munro (1934). *T. nigerrimum* is recorded here for the first time from the Comoros.

MATERIAL EXAMINED. COMOROS: 1 ♂, 1 ♀, Fomboni, Moheli Is., June, J. M. and Pr. M. (det. H. K. Munro, 1957) (NCI).

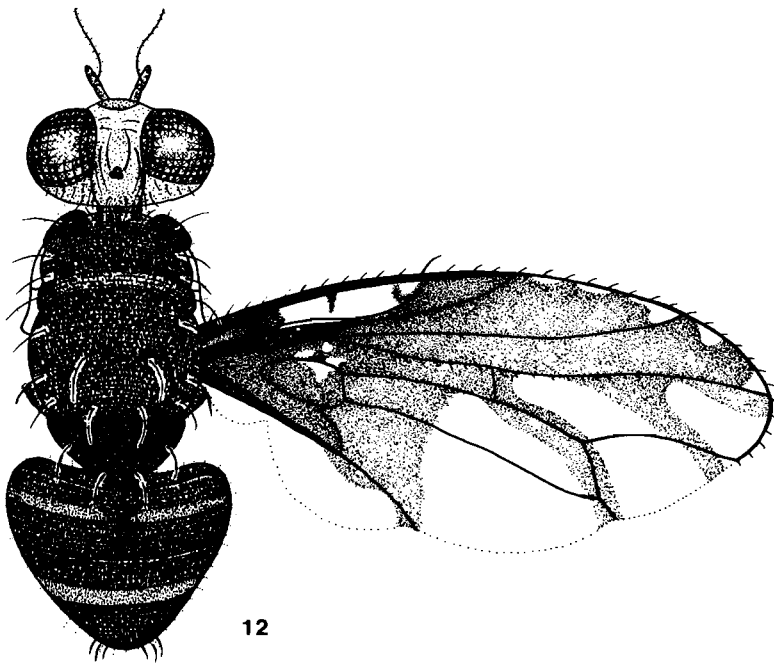
DISTRIBUTION. Sub-Saharan Africa and Comoros.

Trirhithrum resplendens sp. nov. Fig. 12

This species runs to *T. nigrum* (Graham) in Munro's (1934) key but differs from it and related species by the metallic body colour, well developed medial wing band and pubescent arista.

MALE. Length of body, 4.5 mm; of wing, 4.5 mm.

Head. Length:height:width: 1:1.3:1.9. Frons broad, 0.4 times width of head, dark red-brown, becoming dark fulvous on anterior half; bristles black, ocellars well de-

Fig. 12. *Trirhithrum resplendens* sp. nov., male.

veloped, two inferior orbitals, two superior orbitals. Lunule small, fulvous. Antennae about three-quarters length of face, brown; arista with short pubescence. Face white, narrowly red-brown below antennae. Cheeks narrow, fulvous to white. Genae red-brown below eyes. Occiput red-brown, a row of black occipital bristles present.

Thorax. Mesonotum metallic blue-green with a narrow band of white pubescence, often indistinct, across sutures; humeral calli brown. Pleurae blackish-brown; mesopleura with a diagonal white or yellow stripe, broadest posteriorly where it extends from mesopleural bristle to about half width of mesopleura, narrowing to a point behind humeral callus; hypopleural calli blackish-brown. Bristles black, normal, one mesopleural. Scutellum metallic blue-green, four bristles. Legs with femora and hind tibiae blackish-brown, mid tibiae brown on anterior half, remainder, including all tarsi, fulvous. Wing with third vein setulose; pattern blackish-brown with a hyaline indentation before stigma and weak indentations in marginal and submarginal cells; medial band reaching wing margin; cubital band present.

Abdomen. Metallic blue-green with bands of silvery-grey dust along hind margins of second and fourth segments. Metallic blue-green areas of thorax and abdomen often with purple reflections.

FEMALE. Unknown.

MATERIAL EXAMINED. Holotype ♂: MADAGASCAR (EAST): and 4 ♂ paratypes, Sandrangato (Moramanga district); 2 ♂ paratypes, Perinet (Moramanga district); 1 ♂ paratype, Perinet, ix.1955, R. Vieu; 2 ♂ paratypes, Andasy II (camp 2), Marojejy (Massif), 1300 m, Sambava district, xii.1958, E. Raharizonina (NCI); 1 ♂ paratype, Ambodivoangy, 20 m, Maroantsetra district, 16–20.iii.1958, B. Stuckenberg (NM).

DISTRIBUTION. East Madagascar.

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REFERENCES

- BEZZI, M. 1913. Altre *Ceratitis* africane allevate del Prof. F. Silvestri. *Bollettino del Laboratorio di zoologia generale e agraria della R. Scuola superiore d'agricoltura, Portici* **7**: 19–26.
- 1918. Notes on the Ethiopian fruit-flies of the family Trypanecidae, other than *Dacus* (s.l.), with descriptions of new genera and species (Dipt.).—1. *Bulletin of Entomological Research* **8**: 215–251.
- 1923. Trypanéides d'Afrique (Dipt.) de la Collection de Muséum National de Paris. *Bulletin du Muséum d'histoire naturelle, Paris* **29**: 523–530.
- 1924a. South African Trypanecid Diptera in the collection of the South African Museum. *Annals of the South African Museum* **19**: 449–577.
- 1924b. Further notes on the Ethiopian fruit-flies, with keys to all the known genera and species. *Bulletin of Entomological Research* **15**: 73–154.
- COGAN, B. H. & MUNRO, H. K. 1980. Family Tephritidae. In: *Catalogue of the Diptera of the Afrotropical Region*. Ed. R. W. Crosskey. British Museum (Natural History), London; pp 518–554.
- GUÉRIN-MÉNEVILLE, F. E. 1843. Monographie d'un genre de Muscides, nommé *Ceratitis*. *Revue zoologique de la Société de Cuvier* **6**: 194–201.
- HANCOCK, D. L. 1981. Some economic Zimbabwean fruit flies (Diptera: Tephritidae). *Hortus* (Zimbabwe) **27**: 11–15.
- KARSCH, F. A. 1887. Dipterologisches von der Delagoabai. *Entomologische Nachrichten* **13**: 22–26.
- LAMB, C. G. 1914. The Percy Sladen Trust Expedition to the Indian Ocean in 1905, under the leadership of Mr J. Stanley Gardiner, M.A. Vol. 5. No. XV. — Diptera: Heteroneuridae, Ortalidae, Trypetidae, Micropezidae, Drosophilidae, Geomyzidae, Milichidae. *Transactions of the Linnaean Society of London* (2, Zoology) **16**: 307–372.
- MACLEAY, W. S. 1829. Notice of *Ceratitis citriperda*, an insect very destructive to oranges. *Zoological Journal, London* **4**: 475–482.
- MOUTIA, L. A. 1955. The commoner insect pests of orchards, food crops, vegetables, flower gardens and household in Mauritius. *Bulletin, Department of Agriculture, Colony of Mauritius* **91**: 1–79; 3rd. ed.
- MUNRO, H. K. 1925. Biological notes on South African Trypanecidae (fruit-flies) — 1. *Entomology Memoirs, Department of Agriculture, Union of South Africa* **3**: 39–67.

- . 1933. Records of South African fruit-flies (Trypetidae, Diptera), with descriptions of new species. *Entomology Memoirs, Department of Agriculture, Union of South Africa* **8**: 25-45.
- . 1934. A review of the species of the subgenus *Trirhithrum*, Bezzi (Trypetidae, Diptera). *Bulletin of Entomological Research* **25**: 473-489.
- . 1939. Some new species of South African Trypetidae (Diptera), including one from Madagascar. *Journal of the Entomological Society of Southern Africa* **2**: 139-153.
- . 1954. Note sur les Trypetides de Madagascar et description de nouvelles especes cecidogenes (Diptera). *Mémoires de l'Institut Scientifique de Madagascar (E)* **4**(1953): 543-552.
- . 1969. Contributions à la connaissance de la faune entomologique de la Côte-D'Ivoire (J. Decelle, 1961-1964). XLV. - Diptera Trypetidae. *Annales du Musée Royal de l'Afrique Centrale, Serie in 8vo, Sciences Zoologiques* **175**: 415-435.
- ORIAN, A. J. E. 1962a. Pest control recommendations made by the Division of Entomology of the Department of Agriculture, Mauritius. *Revue Agricole et Sucrière de l'Île Maurice* **41**: 87-116.
- . 1962b. A list of the Diptera recorded from Mauritius. *Bulletin, Department of Agriculture, Colony of Mauritius* **94**: 1-31.
- ORIAN, A. J. E. & MOUTIA, L. A. 1960. Fruit flies (Trypetidae) of economic importance in Mauritius. *Revue Agricole et Sucrière de l'Île Maurice* **39**: 142-150.
- SILVESTRI, F. 1913. Viaggio in Africa per cercare parassiti di mosche dei frutti. *Bollettino del Laboratorio di zoologia generale e agraria della R. Scuola superiore d'agricoltura, Portici* **8**(1914): 1-164.
- WALKER, F. 1849. *List of the specimens of dipterous insects in the collection of the British Museum* **4**: 688-1172. British Museum, London.
- WIEDEMANN, C. R. W. 1824. *Munus rectoris in Academia Christiana Albertina aditurus Analecta entomologica ex Museo Regio Havniensi maxime congesta profert iconibusque illustrat*. 60 pp, Kiel.

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